CLAIMS

What is claimed is:

1. A system comprising:

a bus including a first conductive trace;

a first device to generate a first symbol and to drive the first symbol onto the first conductive trace; and

a plurality of receiving devices to sample the first symbol through balanced electromagnetic couplers, wherein each balanced electromagnetic coupler is comprised of a second conductive trace, and wherein the projection of the second conductive trace, onto the first conductive trace, crosses the first conducive trace a plurality of times.

2. The system of claim 1, wherein each balanced electromagnetic coupler has a coupling coefficients in the range of .1 to .4.

3. The system of claim 1, wherein each balanced electromagnetic coupler includes a first component, which is associated with the first conductive trace, a second component, which is associated with the second conductive trace, and a dielectric medium between the first and second conductive traces.

4. The system of claim 3, wherein at least one of the first and second conductive traces has a geometry that reduces changes in a selected coupling coefficient with variations in positions of the first and second conductive traces.

5. The system of claim 4, wherein the first and second conductive traces have complementary zig-zag geometries.

6. The system of claim 4, wherein the selected coupling coefficients are in the range of .1 to .4.

7. The system of claim 1, wherein each of the balanced electromagnetic couplers has a length selected to transfer a targeted fraction of a sampled signal energy (ε) without limiting bandwidth of the system.

8. The system of claim 7, wherein-at least one of the first and second conductive traces has a geometry that reduces changes in a coupling coefficient of the electromagnetic coupler with variations in nominal positions of first and second components.

9. The system of claim 1, wherein the first device includes a transmitter to generate the first symbol from a plurality of bits and a clock signal.

10. The system of claim 9, wherein the bus further includes a third trace to transmit the clock signal.

11. The system of claim 10, wherein the first trace is a pair of traces and the symbol is transmitted as a differential signal.

12. The system of claim 1, wherein the bus is on a first circuit board and at least one of the receiving devices is on a second circuit board.

13. The system of claim 12, wherein the second circuit board is separably coupled to the first circuit board through the electromagnetic coupler.

14. The system of claim 1, wherein the first device includes a transmitter to encode a first set of bits in the symbol and receiver to decode a received symbol into a second set of bits.

15. The system of claim 14, wherein at least one of the plurality of receiving devices includes a receiver to decode the first symbol into the first set of bits and a transmitter to encode a third set of bits in a third symbol.

16. The system of claim 15, wherein the at least one receiving device drives the third symbol on the bus through its electromagnetic coupler.

17. The system of claim 16, wherein the first, second, and third symbols are encoding using one or more of phase modulation, pulse-width modulation, rise-time modulation, and amplitude modulation.

18. A system comprising:

a first conductive trace having multiple first coupling components characterized by a first geometry;

a first device to drive a signal on the first conductive trace; and

multiple receiving devices positioned adjacent to corresponding ones of the first coupling components, each receiving device having a second coupling component characterized by a second geometry and positioned relative to the corresponding first coupling component to form an electromagnetic coupler, wherein a projection of the second coupling component onto the corresponding

first coupling component crosses the first coupling component a plurality of times.

19. The system of claim 18, wherein the coupling coefficient has a nominal value selected from the range of .1 to .4.

20. The system of claim 18, wherein the first device drives the signal on the conductive trace through a direct electrical connection.

21. The system of claim 18, wherein the at least one of the first and second geometries alleviates dependence of the coupling coefficient on relative positions of the first and second coupling components.

22. The system of claim 18, wherein the first device is an interface of a first integrated circuit and the signal includes a symbol that encodes multiple bits provided by the first integrated circuit.

23. The system of claim 22, wherein the second device is an interface of a second integrated circuit, the interface including a decoder to extract the multiple bits from a waveform transferred to the second device through the corresponding first and second coupling components.

24. The system of claim 18, wherein the second device drives a signal on the conductive trace through the electromagnetic coupler formed by the first and second coupling components.

25. A system comprising:

a bus trace on a circuit board, the bus trace including a first coupling component;

a device removably connected to the circuit board in a first position relative to the first coupling component, the first position having a designated precision; and

a second coupling component associated with the device, the second coupling component to form an electromagnetic coupler, wherein a projection of the second coupling component crosses the first coupling component at least once when in the first position.

26. The system of claim 25, wherein at least one of the first and second coupling components has a geometry that preserves the selected nominal value within a specified range for the designated precision of the first position.

27. The system of claim 25, wherein a length of the electromagnetic coupler is selected to support signaling on the bus trace at frequencies up to a specified frequency.

28. The system of claim 25, wherein a length of the electromagnetic coupler is selected to transfer a specified fraction of signal energy on the bus trace.

29. The system of claim 26, wherein the geometry is a zig-zag geometry.

30. The system of claim 26, wherein the device and the second coupling component are mounted on a flexible circuit board that is pressed against the first circuit board.

31. A system comprising:

a first conductive trace having a first length and first width;

a first device coupled to the first conductive trace to drive a symbol on the first conductive trace;

a second device to receive the symbol including a second conductive trace that is parallel to the first conductive trace, wherein the second conductive trace has a second width that is different from the first width of the first conductive trace.

32. The system of claim 31, wherein the second width of the second conductive trace is smaller than the first width of the first conductive trace.

33. The system of claim 32, wherein the second width of the second conductive trace is larger than the first width of the first conductive trace.

34. The system of claim 31, wherein the second device is removable from the system.